International Journal of Development and Economic Sustainability
Vol.10, No.6, pp.1-17, 2022
Print ISSN: 2053-2199 (Print),
Online ISSN: 2053-2202(Online)

Revenue Per Capita and Economic Growth Nexus: Building a New Revenue Framework for Nigeria

Silva Opuala -Charles [a] Jonah O. Orji [b*]
[a- b] Garden City Premier Business School, Plot 13 Herbert Macaulay Street, Old G.R.A, Port Harcourt, Rivers State, Nigeria

Citation: Opuala-Charles S. and Orji J.O. (2022) Revenue Per Capita and Economic Growth Nexus: Building a New Revenue Framework for Nigeria, *International Journal of Development and Economic Sustainability*, Vol.10, No.6, pp.1-17

ABSTRACT: *The challenging consequences of poor economic performance across most emerging economies is a reflection of the weak public revenue management system. Hence, the study into Revenue per capita and Economic growth nexus: Building a new revenue framework for Nigeria. The study employed the Parsimonious Error Correction Model (ECM) for adjusting the parameters of auto regressive distributed lag (ARDL) model to examine the outcome of economic growth, proxy of real gross domestic product (RGDP) on Revenue per capita, proxy of gross national product per capita(GNPPC); gross fixed capital formation (GFCF); and Inflation rate (INFR). The finding revealed a significant positive relationship between GDP and its lagged value, as well as GNPPC. Whereas, a negative but significant impact subsist between GDP and lagged value of GNPPC; while, an insignificant negative impact exists between GDP and GFCF and its lagged value. Inflation rate exhibited a moderate significant inverse relationship with economic growth during the review period. Based on the finding, It was recommended among others: tax revenue generating agencies should pursue fiscal sustainability by rethinking Nigeria's tax policy mix and design to consummate enduring prosperity for Nigerians.*

KEYWORDS: tax revenue, economic growth, revenue per capita, investment

Classification: D4, E5, F6, O15, J10

INTRODUCTION

The main revenue of nation states is taxation, and other non - tax revenue items. Hence, for the provision of public goods as well as redistribution of income objectives to be achieved, government has to generate revenue in the form of taxation Salawu (2005). OECDs (2019) affirmed in their report that government revenues serve the purpose of financing the provision of goods and services to the population (such as health care and defense), as well as allowing the state to carry out its redistributive role (through subsidies and social benefits). It is becomes sufficient to say that, the main sources of government revenue are taxes, capital receipts and other non-tax revenue earnings. Therefore, the collection of taxes and other statutory levies is a critical

development priority that aims to finance investments in human capital, infrastructure, and service delivery for citizens and businesses, as well as to set the right price incentives for long-term private-sector investment World Bank (2022).Tax has been defined as a compulsory levy imposed by government on individuals, goods and services and corporate bodies for the purpose of financing government expenditures; social services, administration of government and capital projects.

The purpose of taxation other than the points outlined in the forgoing passage may include but not limited to: achieve income equality, encourage local production, boost balance of payment equilibrium, ensure price stability, discourage consumption of harmful goods and promote economic growth. The growth of public revenue and its impact on economic growth is highly correlated with the domestic revenue framework which significantly manifest in the various tax systems and the operational structure in an economy.

The tax system and structure has a significant impact on the aggregate revenue available for government to execute growth led programmes. Most tax system are premised on the macroeconomic objective(s) of government. To ensure income redistribution and closing the income gap; a progressive tax system could be employed to improve consumption of the poorer section of an economy. Although, a combination of economic factors contribute jointly to impact per capita income of households and corporations. But, government in a bid to curb inflation increases personal income taxes while reducing corporate taxes in some instances. This action of government will create an offsetting force in revenue per capita as consumption level drop in the short run, while the corporate net profit margin increases. However, if the declined consumption persisted in a long period; it will exact adverse shock on aggregate demand and corporate profit thereby, further dampening the household per capita income due to decrease wage rate or job loss effect. In a quick reaction to low aggregate demand, the need to promote economic growth becomes a centerpiece of attention as tax holiday and other rebate may induce further investment and enhances production.

Move over, growth of an economy is a critical function of government expenditure; and government expenditure is a function of tax and non-tax revenue receipt. Therefore, the gross national products per capita is largely dependent on the activities of household and firms revenue performance. The growth of output emanates from the level of domestic investment in real capital, improve welfare of labour and the market price of goods and services. It follows that, the growth of gross national product (GNP) per capita has a significant leap on the rate of productivity of labour per domestic population. It is remarkably true that, the success of every market economy is largely dependent on the average commodities produced at home by a given working labour force, consumed and exported. Hence, the growth of aggregate final output of nation is one of the critical components of measuring economic wellbeing.

It is rather unfortunate that, nations across the globe are seriously facing challenges of declined output, domestic savings, low investment and gross fixed capital formation. Nigeria is not an

exception with declining level of productivity; albeit, specific factors has been attributed to the challenges of low output. Specifically, manufacturing cost of production derivable from rising energy cost, increased wage demand, and low market demand for final products, and high caring cost of inventory has resulted in shrink-flation.

It follows that, aggregate decline in economic activities has a significant bearing on low tax returns per annum which limits the ability of government to perform its total spending function, and stimulate the economy. Hence, the low income per head imposed a revenue constraints on aggregate tax returns in any economy. The growth of revenue per head exact a direct effect on government revenue spending; thereby, stimulating economic growth. This pertinent issue of low income is persistent within the Nigerian revenue space.

Scholarly findings has it that, the highest annual amount of Value Added Tax (VAT) generated in Nigeria since 1994 is N1.53trillion, while total tax revenue of N7trillion was reported in 2020 David (2020). Basically, Nigeria has two major corporate income taxes: the company income tax (CIT) and the petroleum profits tax (PPT). Other taxes include tertiary education tax, capital gains tax and information technology tax. While, Asia, Africa, and South America rely more on consumption taxes and corporate income taxes and less on income and social insurance taxes compared to the average OECDs. But in 2019, OECDs countries raised on average, one-third of their tax revenue through consumption taxes such as the Value-added Tax (VAT), making consumption taxes the most important revenue source. In the same year, 2019, OECD countries, on average, collected little from the corporate income tax (9.6 percent) and property tax (5.6 percent).Besides about 16.1 per cent of sum total tax collected by the federal authorities in 10 OECDs nations were regionally sourced. Whereas, the Nigeria's VAT revenue position as gathered from empirical finding (Ademola in FIRS ,2020), NCS-imported and non-imported VATs for half year 2020 amounted to N653.11 billion, a decrease of 11.49 per cent compared to N737.92 billion generated in the corresponding period of 2019. Unfortunately, most developing countries do not employ sound tax policies, and had limited their capacity to improving on revenue to GDP ratio (Opuala- Charles, 2019; Cihak, 2012).These challenging economic conditions due to poor per capita revenue performance in Nigeria resulted in the following questions:

Does the amount of VAT generated annually truly reflect the taxable consumption in Nigeria? And does it truly reflect the economic activities carried out in Nigeria?

These scholarly questions was posed in a public domain as an inquiry to ascertain whether or not the actual revenue generated in Nigeria is a true representation of economic activities of household and firms. Further, it seeks to know whether the right tax system and framework has been employed to curb fiscal porosity and corrupt tax system in Nigeria. Empirical evidence and cross country analysis has shown the level of tax revenue gap and lack of fiscal space prevalence within Nigerian domestic economy has adversely impacted on economic growth and its potentials. In spite the population of over 206million consumers with 53.12 per cent aged 15 – 65 years (O'Neill in Statista, 2022), who are active workforce yet, revenue per capita declines. This reflect the fiscal

position of Nigeria's tax authority whose total tax revenue target distorts adversely from 2010 to 2022 period. The negative distortions of 2015 to 2020 to the tune of 8.8 billion Naira was not met in 2019 rather, a realization of about 5.2 billion Naira, resulted in a revenue gap of 3.6 billion Naira in 2019 Opuala-Charles and Orji (2022).

Most expert opinions has it that, the ill-suited tax policy design exempt the right tax payers within the tax net. This assertion is accentuated by the prescription (Opuala- Charles, 2019),who concluded that most developing countries do not employ sound tax policies, and had limited their capacity to improving on revenue to GDP ratio. A closer look at Nigeria and South Africa identified the lacunar in the Nigeria's Personal Income Tax Act. South Africa with about 60 million people, and individuals registered personal Income tax payers of 23.9 million in 2020/21 and 22.9 million in 2019/20 (SARS,2021), generated , about R1 249.7 billion (67.82 Billion'USD), contributing a share of 39.1%.Wheras, Nigeria with the over 206million taxable adult, and 41 million registered personal income tax payers (Wami,2021), generated 20.499 billion USD. While this issue persisted, the economic growth has significantly under performed with the annual growth rate moderated at 3.98 per cent in 2021 NBS (2021). The per capita income averaged at -0.58 per cent in 2021 from 9.97 percent in 2019 WB (2021). This is supported by the scholarly finding (Ahmed, 2009), who suggested positive relationship between government expenditure and GDP per head growth, and negative relationship of taxation with GDP per head across selected Asian countries. Whereas, the growth outlook for Nigeria may be demand induced or supply led. The supply driven growth was profound with the African development bank's report in Nigeria: Nigeria's economy grew by 3.6% in 2021 from a 1.8% contraction in 2020, the supply side led growth of about 4.4% expansion emanates from the non-oil sector against 8.3% contraction in the oil sector. But, non-oil growth was driven by agriculture (2.1%) and services (5.6%) AfDB (2021).While, the demand side induced growth manifested in the form of increased per capita income by 1.0% in 2021. The fiscal deficit narrowed to 4.8% of GDP in 2021 from 5.4% in 2020, due to a modest uptick in revenues, and was financed by borrowing. Public debt stood at $95.8 billion in 2021, or about 22.5% of GDP. The fiscal incoherence in collection of digital tax culminated in another round of problems, about 6% tax rate on turnover was benchmarked for non-resident companies especially telecommunication and online based tech - companies with physical presence or large clients base in Nigeria. Whereas, fair and reasonable rate for the digital service taxes below 6 per cent are charged in other jurisdictions. France and UK impose 3% and 2% digital service tax respectively; while Kenya imposes 1.5% digital service tax. Canada is in advanced stage of launching its 3% digital service tax on all in-country revenues earned on digital activities. It is in the light of the need to investigate a new path for revenue growth that prompted the study on the casual relationship between revenue per capita and economic growth in Nigeria from 1981 – 2021.

LITERATURE

Wagner 's Law

The German Economist, Adolph Wagner (1835- 1917) enunciated a theorem which states that government spending must increase to stimulate more than proportionate growth of gross national product. The theory expressed a functional relationship between the growth of an economy and the growth of government spending, such that as both increases, there is a tendency for the economy to grow at a faster rate. Wagner added in his argument that, the growth of an economy will result in industrialization and economic development.

Peacock – Wiseman's Theory

In study of public crisis in UK for the period 1890-1955, Allan Peacock and Jack Wiseman reported that during socio-political crisis such as war and epidemic, people's tax tolerance level is high and government often takes the advantage of it to increase the level of taxes so as to raise revenue to combat such crisis. This upward tax review create a "displacement effect on income". Peacock and Wiseman theory presumes government spending increases not significantly rather in a step like manner through gradually increasing tax revenue during crisis, which when the rate is increased remain stable; and never revert to its original stage after the crisis. The process continued in gradual succession and tax payers becomes accustomed to the new tax regime thereby increasing government revenue over time. The acceptance of new tax regime created a concentration effect on government to collect more revenue from taxable sources.

Musgrave Theory

This theory is otherwise called the development model theory whose law is validated by the Musgrave argument that, at low level of capital income, the demand for public service tends to be generally high. Given that the early stage of economic development comes with a low income level, and government is forced to provide the basic infrastructure for economic take – off. Whereas, when per capita income starts to rise beyond the initial low stage, demand for infrastructural development increases. In sum, increase in per capita income of government result in a more than proportionate increase in economic growth and development.

Harrod-Domar Theory:

Harrod-Domar theory is considered as the extension of Keynes' short-term analysis of full employment and income theory. The Harrod-Domar growth model provides a long-term theory of output which is predicated on investment. Investment is a function of savings and gross capital formation. Harrod and Domar have provided a model that focuses on the requirements necessary for steady economic growth. According to them, capital formation constitutes a major factor for the growth of an economy. They also emphasized that capital formation not only generates income, but also increases the production capacity of the economy.

According to Harrod-Domar theory, the most necessary condition for the growth of an economy is that the demand created due to newly generated income should be sufficient enough, so that the output produced by the new investment (increase in capital) should be fully absorbed by the market. Whereas the consumption of the newly produced goods and services is financed through savings. The relationship follows the savings equations:

$S = sY, (s > 0)$ (2.1).

Where: S = saving per unit time
S = constant propensity to save
Y = national income

The Aggregate Demand Theory

The theory posits the relationship between gross domestic products and total spending in an economy. The relationship between price level and the amount of real gross domestic product demanded is inverse. This theory emphasizes much on the real balance effect of change in price level. It means that, a higher price level reduces the purchasing power of accumulated savings balances thereby, adversely impacting on the public consumption and investment spending. Government interference to curb inflation may adopt policy mix through tax reduction. This action of government adversely impact on per capita revenue of government while increasing private consumption expenditure

Empirical Literature

Vassilis (2009) systematically studied Per capita income and Inequality in European countries. The analysis is conducted using cross-sectional and panel data growth models with spatial interaction effects. The empirical study specifically separated counties specific characteristics with respect to income, inequality, unemployment and growth of income. The results reveal the presence of a conditional convergence in income per capita using unemployment, sectoral tax composition, spatially lagged growth of income per capita as a control measure. Within the taxation purview, Williams & Andrew (2014) evaluated how changes in the individual income tax affect long-term economic growth in America. The argument was drawn along the supply side effect of tax cut America, and how that action impact on government budget deficit. Whereas, another dimension of tax policy reform was studied specifically, the demand side equation. The study employed both theoretical evidence and simulation methods using a historical data to explain the effect of changes in consumption spending due to tax cut. While, limiting the long term economic growth. The results suggest that" not all tax changes will have the same impact on growth. Reforms that improve incentives, reduce existing subsidies, avoid windfall gains, and avoid deficit financing will have more auspicious effects on the long-term size of the economy, but may also create trade-offs between equity and efficiency". Whereas, Ayeni & Cordellia (2022) researched on tax revenue and economic growth in Nigeria. The findings reveal that Petroleum Profit Tax and Value Added Tax have positive and significant effects on GDP while company income tax respond negatively to economy growth during the review period. The study however, made a unique recommendation to properly encourage companies to pay up their taxes as and when due to Nigeria Internal Revenue Service

METHODOLOGY

The study design is ex post factor having collected validated institutional data from Central Bank of Nigeria statisticall bulletin and World development indicator.Sample variables are to be used to model the relationship between Revenue per capita and Economic growth in Nigeria spanning the period of 1981 – 2021.

Moveover, the study will be premised on the Aggregate demand theory with its policy prescription.Also, the variable a priori expectation is based on the various theories related to Revenue per capita and Economic growth in Nigeria. Therfore, the model is specified as the ARDL of order (p,q) model expressed as follows;

$Yt = \beta_0 + \beta_1 y_1 + \ldots\ldots + \beta pYt\text{-}p + \alpha_0 Xt + \alpha_1 Xt\text{-}_1 + \ldots\ldots + \alpha qXt\text{-}q + \varepsilon_t$ ……(3.1) where, ε_t is a random disturbance term or error term. The model is autoregressive because Yt is explained partly by its lagged values. It also has a distributed lagged component in the form of successive lags of the X – explanatory variables. According to Odhiambo (2010) and Al-Malkawietet al.(2012), ARDL approach is more reliable and preferable in estimating the co-integration relationship to other methods like Engle and Granger (1987), Johansen (1988) and Gregory Hansen (1996). The model yields consistent estimates of the long-run coefficients that are asymptotically normal, irrespective of whether the underlying regressors are I(0) or I(1). More so, it gives the opportunity to explore correct dynamic structure. Finally, it allows for the inferences on impact estimates.

Baseline Functional relationships

RGDP = f (GNPpc, GFCF, INF) (3.2)

$Y_t = \alpha_t + \beta_1 X_t + \beta_2 X_t + \beta_3 X_t$ (2.3)

$Y_t = \alpha_t + \beta_1 X_t + \beta_2 X_t + \beta_3 X_t + \mu_t$ (3.4)

$linRGDP_t = \alpha_t + \beta_1 linGNPpc_t + \beta_2 linGFCF_t + \beta_3 linINFR_t + \mu_t$ (3.5)

Where: RGDP = gross domestic product measures over time period,proxy for Economic Growth
GNppc = gross national product per capita
GFCF = gross fixed capital formation (investment)
INF = inflation rate.
$\beta_1 - \beta_3$ = Parameters of the model
α_t = Intercept term
lin = Natural logarithms

Varibles and Measurement

The meassure,emy variable discuses the whtehr or not the sign and sizes of the model parameter conform to the theoretical expectaion .Also, measurong the sources of data and units of measurments is an importance metrics as presented in the table below:

Table 3.2: Variables Discription and Measurement

VARIABLE	MEASUREMENT	SOURCES	A PRIORI
RGDP	Billions of Naira	Central Bank Statisticall Bulletin	(+)
GNPpc	Billions of Naira	World Development Indicator	(+)
GFCF	Billions of Naira	World Development Indicator	(+)
INFR	Annual perecntage rate	World Development Indicator	(-)

Source: Authors Formulation (2022).

Government revenues per capita should be calculated by converting total revenues to USD using the Nigeria/U.S dollar purchasing power parity (PPP) for GDP and dividing them by the population of the country.Rather, a per capita gross national product measured in local currency units (₦'000) was used as a suitable revenue indicator. PPP is the number of units of country B's currency needed to purchase the same quantity of goods and services in country A.

Empirircal Analysis

This session discuses the Univariate descrption of outcomes of each variables used in our model. It seeks to test for normality of the sample distribution in terms of mean value,kurtosis and skewness. This enables for understanding the behaviour of each variable used the model. Essentially, RGDP yielded average value of 10.40 ; GNPPC resulted in averge value of 12.43;GFCF yelded 29.76 and INFR yeilded 2.68. In sum, GFCF has the highest mean value while INFR yelded low mean value. RGDP has range of values within 9.69 – 11.20 ; GNPPC ranges from 12.13 – 12.83 ; GFCF has mininmum value to maximum of 29.36 – 30.39; and INFR ranges from 1.68 – 4.28. Implicitly, the variables followed a smooth trend line when computed. . The measure of kurtosis for the distribution has fewer variables with flat curve such as , RDGP, GNPPC, and INFR except for GFCF with a peaked curve.The summary univaraite descriptive statistics and analyis is reported in Table 4.1 below:

Table 4.1 : Summary Descriptive Statistics

	LINRGDP	LINGNPPC	LINGFCF	LININFR
Mean	10.40814	12.43434	29.76394	2.680161
Median	10.20119	12.35385	29.74078	2.554899
Maximum	11.20344	12.83930	30.39038	4.288128
Minimum	9.693476	12.13785	29.36601	1.682688
Std. Dev.	0.534044	0.247434	0.214407	0.676079
Skewness	0.267289	0.367292	0.484110	0.882183
Kurtosis	1.496112	1.474507	3.426105	2.996489
Jarque-Bera	4.351901	4.897353	1.911652	5.318044
Probability	0.113500	0.086408	0.384494	0.070017
Sum	426.7338	509.8080	1220.321	109.8866
Sum Sq. Dev.	11.40811	2.448947	1.838807	18.28329
Observations	41	41	41	41

Source: Authors' Computation (2022).

Augmented Dickey Fuller (ADF) Unit Root Analysis

Test for stationarity to show the stability of time series trend over the time period indicates a mixed order of integration I(0) and I(1) respectively. However, the RGDP, GNPPC and GFCF are integrated order one, I(1) while INFR is integrated of order zero. The order of integration was derived from comparing Augmented Dickey Fuller statistic result of each variables to their critical values at 5 per cent level of significance. Hence, the adoption of auto regressive distributed lag model (ARDL). See Table 4.2 below.

Table 4.2 Unit Root Test

Variables	Levels (ADF) [1] stat.	Test value (5%)*	First diff. (ADF) stat	Test value (5%)	Order of integration	Prob.
LRGDP	NIL	NIL	-3.987407	-2.938987	I(1)	0.0037
LGNPPC	NIL	NIL	-4.754293	-2.938987	I(1)	0.0004
LGFCF	NIL	NIL	-5.196276	-2.941145	I(1)	0.0001
LINFR	-3.497434	-2.936942	NIL	NIL	I(0)	0.0132

Source: Authors' Computation (2022).

ADF[1] = Augmented Dickey Fuller unit root test with constant. MacKinnon (1996)* one-sided p-values. The ADF unit root in Table 4.2 showed level of stationarity of the time series variables @ critical value of 5 per cent, the ADF statistic yielded mixed order of integration.

ARDL Bound Co - integration

In a bid to examine the existence of a long run relationship among the variables of interest, the study employs the Pesaran et al. (2001) autoregressive distributed lag (ARDL) test for co-integration. The use of ARDL co-integration approach rather than the conventional Johansen co-integration testing that hinges on some features of the former that included mixture of I(0) and I(1) data, assigned different lag-lengths for different variables as they enter the model. It does not require unit root testing as a prerequisite in the conventional approach, but could be used whether the underlying variables are I(0), I(1) or fractionally integrated. This is coupled with the fact that it involves just a single-equation set-up, making it simple to implement and interpret.

According to Pesaran and Pesaran (1997) and Pesaran and Shin (1998) the augmented ARDL $\left(p, q_1 q_2, ..., q_k\right)$ can be written as:

$$\alpha\left(L, p\right) y_t = \alpha_0 + \sum_{i=1}^{k} \beta_i \left(L, q_i\right) x_{i,t} + \varepsilon_t \qquad 4.1$$

Where α_0 is a constant, y_t denote the dependent variable, L is a lag operator, $x_{i,t}$ is the vector of regressors (where $i = 1, 2 \ldots k$) and εt is the disturbance term. In the long-run, we have $y_t = y_{t-1} = ... = y_{t-q}$ and $x_{it} = x_{i,t-1} = ... = x_{i,t-q}$. Here, $x_{i,t-q}$ denotes q^{th} lag of the i^{th} variable. The long run equation can be written as follows:

$$y_t = \alpha + \sum_{i=1}^{k} \beta_i x_i + \varepsilon_t \qquad 4.2$$

Table 4.3 ARDL Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	16.42857	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Authors' Computation (2022).

By comparing the result of F- statistic (16.42) to both upper and lower bounds series of Table 4.3 at 5 per cent level of significance, the result showed a long run relationship between revenue per capita and economic growth. Hence, the need for error correlation mechanism.

Error Correction Model (ECM).
The Granger representation theorem establishes formally the theoretical basis of error correction modeling. The theorem stipulates that, if y(t) and x(t) are co-integrated, then there is a long-run relationship between them. In addition, the theorem proves that the short-run adjustment dynamics can be usefully described by the error correction model (ECM). In simple terms, the ECM involves using the lagged residual to correct for deviations of actual values from the long-run equilibrium values. In applied work, we require that the coefficient of ECM be significant and negative. Its sign should be negative if it is to play the role of error correction. Specifically, if actual equilibrium value is too high, the error correction term will reduce it while if it is too low, the error correction term will raise it.

The error correction (EC) representation of the ARDL model can be written as follows:

$$\Delta y_t = \Delta\alpha_0 - \sum_{j=1}^{p} \alpha_j \Delta y_{t-j} + \sum_{i=1}^{k} \beta_{i0} \Delta x_{it} - \sum_{i=1}^{k} \sum_{j=1}^{q} \beta_{it-j} \Delta x_{i,t-j} - \alpha(1, p) ECM_{t-1} + \varepsilon_t$$

$$ECM_t = y_t - \alpha - \sum_{i=1}^{k} \beta_i x_{it} \qquad (4.3)$$

Where Δ is the first difference operator, $\alpha_{j,t-1}$ and $\beta_{i,t-1}$ are the coefficients estimated from equation (12), and $\alpha(1, p)$ measures the speed of adjustment.

Table 4.4 Parsimonious Error Correction Model

Parsimonious ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LINGNPPC)	0.647838	0.068047	9.520507	0.0000
D(LINGFCF)	-0.026361	0.023948	-1.100752	0.2790
CointEq(-1)*	-0.029206	0.003043	9.596850	0.0000

R-squared	0.844505	Mean dependent var	0.032815
Adjusted R-squared	0.836100	S.D. dependent var	0.047136
S.E. of regression	0.019083	Akaike info criterion	-5.008033
Sum squared resid	0.013473	Schwarz criterion	-4.881367
Log likelihood	103.1607	Hannan-Quinn criter.	-4.962235
Durbin-Watson stat	2.527945		

* p-value incompatible with t-Bounds distribution.

Source: Authors' Computation (2022).

The output of parsimonious ECM demonstrated adjustment in the over parametrized model of ARDL, hence, eliminating insignificant variables to achieve a contemporaneous regression result. The finding in Table 4.4 showed economic growth and per capita gross national product was measure same time , and a significant positive causal relationship exist between them. Whereas, gross fixed capital formation measurement was done same time period as economic growth, and both exhibited insignificant negative relationship. Other exogenous variables such as inflation were measured at different time period as with economic growth. The long run co integrating disequilibrium errors is capable of adjustment in less than one year period (CointEq(-1)* = -0.02).

Multivariate Analysis - Test of Multi-collinearity

The multivariate analysis of the model is conducted using correlation analysis to determine the directionality as well as degree of relationships between variables in our model. Hence, keeping the correlation of variables to its own self constant, real gross domestic products yielded a negatively weak relationship with Inflation rate (- 0.27), whereas, a strong positive relationship exist between RGDP and gross national product per capita(0.94). Also, a moderate positive relationship exist between RGDP and GFCF (0.47); INFR yielded a weak negative (-0.30) relationship with GNPPC and (-022) with GFCF while GNPPC yielded positive but moderate (0.59) relationship with GFCF.

Table 4.5 Multi-collinearity Analysis

	LINRGDP	LININFR	LINGNPPC	LINGFCF
LINRGDP	1			
LININFR	-0.27463065	1		
LINGNPPC	0.941128286	-0.300339	1	
LINGFCF	0.47917637	-0.2264395	0.590835	1

Source: Authors' Computation (2022).

4.6 Lag Selection Criterion

The lag selection criteria is conducted to detemine the apprioraite lag oder for the model. This is done using various information criterion – Akaike information crierion (AIC), Bayesian Schwatz criterion (BC) , Hannam- Quin crierion (HQ), and Final Prediction Eroor (FPE). Henec, lag number one , acording to the resuts of Table 4.6 is the optimum lag length in the specification of ARDL model.

Table 4.6 Lag Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	24.02521	NA	4.10e-06	-1.053958	-0.881581	-0.992628
1	181.7575	273.9561*	2.37e-09*	-8.513554*	-7.651666*	-8.206901*
2	195.2457	20.58728	2.79e-09	-8.381354	-6.829957	-7.829379
3	211.7221	21.67937	2.95e-09	-8.406424	-6.165516	-7.609126

Source: Authors' Computation (2022).

4.7 Long run Specification of ARDL Model

The estimate result showed the long run equilibrium relationship between economy growth and its lagged value, and lag values of gross national product per capita; gross fixed capital formation; and Inflation rate.

Table 4.7 Long Run Model of ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LINRGDP(-1)	1.029206	0.022713	45.31331	0.0000
LINGNPPC	0.647838	0.088487	7.321265	0.0000
LINGNPPC(-1)	-0.684561	0.082037	-8.344572	0.0000
LINGFCF	-0.026361	0.032447	-0.812427	0.4224
LINGFCF(-1)	-0.040402	0.027437	-1.472526	0.1504
LININFR	-0.010435	0.005255	-1.985874	0.0554
C	2.195962	0.798354	2.750614	0.0096

R-squared	0.998790	Mean dependent var	10.42107
Adjusted R-squared	0.998570	S.D. dependent var	0.534306
S.E. of regression	0.020206	Akaike info criterion	-4.808033
Sum squared resid	0.013473	Schwarz criterion	-4.512480
Log likelihood	103.1607	Hannan-Quinn criter.	-4.701170
F-statistic	4539.423	Durbin-Watson stat	2.527945
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model

Source: Authors' Computation (2022).

The estimate result showed a joint significant relationship of the explanatory variables: RGDP (-1), GNPPC and its one period lag; gross fixed capital formation (GFCF) and its periodic lag as well as INFR and explained variable of real gross domestic products (RGDP) , Where (F-statistic probability = 0.000) is less than alpha level of 0.05. From the results of Table 4.7, the adjusted R – square denotes the degree of explanatory power sufficient for the joint impact of independent variables on the dependent variable. Hence, a fraction of 1 per cent only accounted for unobserved errors while, 99 per cent tell more about total changes in per capita revenue prior to adjustment of errors

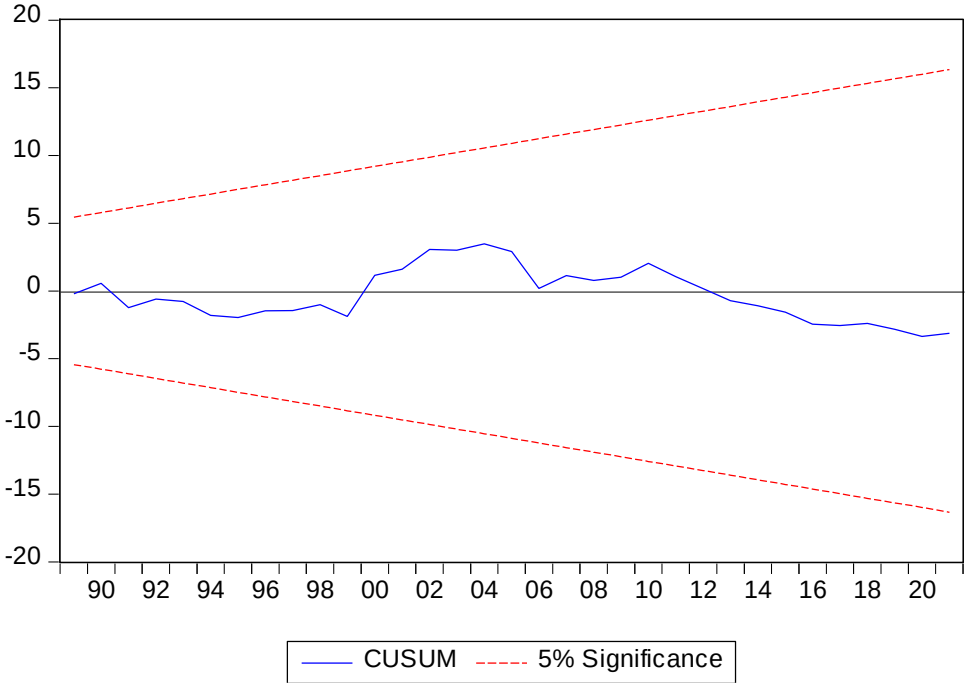
However, there is positive significant relationship between current economic growth and its previous values by about 1.02 percent, while gross domestic product yielded positive significant relationship and changes by 64 per cent, on average as a result of a unit change in gross national products per capita. Same is applied for the declined 68 per cent change in economic growth due to previous value of gross national product per capita. The unit change in gross fixed capital formation exhibited indirect and insignificant relationship, and about 2 percent decrease in economic growth, on average, and its lag value of 4 per cent is due to a unit changes in gross fixed capital formation. Whereas, economy growth decreases by 0.01 percent due to a unit increase in inflation rate prior to long run adjustments.

Parameter Stability Test

The stability of short-run and long-run coefficient is examined by employing cumulative square of the residuals (CUSUM) statistics which shall be up-dated recursively and plotted against the break points. If the plots of CUSUM statistics fall within the critical bounds at 5% level of Significance, the null hypothesis which states that "all coefficients in the given regression are

stable", cannot be rejected. Hence, the results of Fig 4.1 showing the model stability test diagram using cumulative square of the residuals (CUSUM). The stability of parameter stability is attained when cumulative square of the residuals trend line runs in between the dotted red lines, lying between positive value 5 , and negative value of 5.

Fig 4.1 : Parameter Stability Test



Authors Compuation (2022).

DISCCUSIONS OF THE FINDINGS

Evidenec drawn from the findings of the study showed:The growth of previous output signficantly impact on the current rate and speed of economic progress in Nigeria by about 1.02 per cent. This is results conformed to a priori expectation and supportyed by the findings of David (2022).While, gross national product per capita signficantly impact the growth potentials of Nigeria economy current position by about 64 per cent, on average. By implication, per capita revenue growth is capable of increasing signficantly tax base and sources from federal, state and local government level.This results of this finding conformed to theoretical expectation and validated by the works of Ayeni and Cordellia (2022);William & Andrew (2014).But, the lagged value of revenue per capita is inversely related but signficant (β = -0.68 % ; P=0.00) to explaining changes in economic growth in Nigeria during the review period.Implicitly, past revenue of governmmet has not been sufficiently utilized as most were sourced as borrowings , and a proportion tax receipt is expended for debt servicicng, thereby adding less value to economic growth in Nigeria.Furthermore, personal inome tax, especailly VAT does not truly refelect the economic activities in Nigeria, as majority of the consumption tax are not collected due to the growth of informal sector, corruption and bad tax policy design. This assertaion is corroborated by Ayeni and Cordellia (2022); AfDB

(2021) report.Moreso, the scarcity of gross fixed capital formation to boost economic growth has resulted in a declined productivity level at about 2 per cent, on avaerge , during the review period.Hence, the result does not conform to theory as it is expected that, investment should improve economic growth.Dearth of domestic savings and high digital service tax to foreign investors dissuade domestic capital formation in Nigeria. Finally, the growth of economy is attained by 1 percent reduction in Inflation rate in Nigeria.This results is in line with a priori expectation .Therefore,moderate inflation rate will pave way for economic growth rather than double digit inflation rate.

Recommendations

Base on the above findings, the following recommendations were made:

- Tax revenue generating agencies should pursue fiscal sustainability by rethinking Nigeria's Tax Policy Mix and Design to consummate enduring prosperity for Nigerians.
- Policymakers can raise revenues by modifying existing tax policy, enacting new taxes, and boosting economic activity.
- Investing on entreprenueruship and innovation based businesses to boost domestic capacity and income upon which taxes can be raised.
- The digital service tax on foreign companies with Nigerian clients should be fair and sufficent to reflect global best pratctices
- Nigeria tax laws on consuption tax and value added tax should be clear , and be able to capture consuption tax from agro-based and manufacturing products sold in unorganised and remote markets in Nigeria (informal sector).
- Shadow as well as Black market actvities should be regulated,monitored and control so as to elimiate tax evasion and complete boycut.

References

ADB (2021). Recent Macroeconomic and Financial Developments**:** Nigeria Economic Outlook. *African Development Bank Group*. Available at: https://www.afdb.org/en/countries-west-africa-nigeria/nigeria-economic-outlook

Ademola, A. (2020). How electronic platform is boosting tax revenue generation in 2020. Nigeria: Newspaper Article, Business Day**.** https://businessday.ng/research-reports/articl

AFDB (2021). Nigerian Economic Outlook - *Recent macroeconomic and financial development.* African Development Bank. https://www.afdb.org/en/countries-west-africa-nigeria/nigeria-economic-outlook

Ahmed, N.H. (2009). Size of Government and Growth Rate of per Capita Income in Selected Asian Developing Economics. *International Journal of Finance and Economics 1*(28). https://www.researchgate.net/profile/Ahmed-Hakro

Ayeni, O. A., & Cordelia, O. (2022). Tax Revenue and Economic Growth in Nigeria. Cogent Business and Managenmnt,9(1). https://doi.org/10.1080/23311975.2022.2115282

CBN (2013). Central Bank of Nigeria. Real Sector Performance. *Available at: www.cbn.gov.ng.* Retrieved on 21/10/22

Cihak, M., Demirguc-Kunt, A., Erik,H., and Levine, R. (2012). Benchmarking financial systems around the world. Policy Research working paper; no. WPS 6175 Washington, D.C.: World Bank Group. Accessed 0n 8th August 2022 from http://documents.worldbank.org/curated/en/868131468326381955/Benchmarking-financial-systems-around-the-world

Cristina Enache (2021). *Sources of Government Revenue in the OECD.* Tax Foundation. 2021. https://taxfoundation.org/oecd-tax-revenue-2021/

David, K. (2021). The Nigerian Tax System: Through the lens of a futurist. Vanguard: October,6. https://www.vanguardngr.com/2021/10/the-nigerian-tax-system-through-the-lens-of-a-futurist-

Donovan,D. J. (1981). *Macroeconomic Performance and Adjustment under Fund-Support Programmes:* The Experience of the Seventies. IMF eLibrary. ISBN: 9781451946888.

Fred-Young, E. (2018). *Importation and Exportation Business in Nigeria.* Retrieved from https://www.mondaq.com/Nigeria on 02/10/2022

Frenkel, J. A. (1978).Further Evidence on Expectations and the Demand for Money during the German Hyperinflation. *Journal of Monetary Economics 5*(1), 51-96. Available at: https://doi.org/10.1016/0304-3932

McConnell, C. and Brue, S. (2005). Macroeconomics: Principle, Problems and Policies.(6th Edn), NY: McGraw-Hill Publication.

Nami, M. (2021). FIRS: Nigeria now has 41 million taxpayers — but revenue generation still low. [The Cable, Oct., 08]. Available at: https://www.thecable.ng/firs-nigeria-now-has-41-million-taxpayers-but-revenue-generation-still-low

NBS (2021). Nigerian Gross Domestic Product Quarter 4 – Nigerian Bureau of Statistics. https://nigerianstat.gov.ng/elibrary/read/1241137

O'Neill, A. (2022). Age Structure in Nigeria. *Statista Publication*, August, 12th 2022. Available at; https://www.statista.com/statistics/382296/age-structure-in-nigeria/

OECD (2019). General government revenues: *Government at a Glance 2019*, Paris: OECD Publishing. DOI: https://doi.org/10.1787/46327975-en

Opeyemi, B. (2022). Nigeria's Finance Act 2021 and the Digital Tax Framework: Another Attempt to Boil the Ocean?. Available At: https://www.afronomicslaw.org/category/analysis/nigerias-finance-act-

Opuala- Charles,S. (2019).Public finance: perspectives that needs urgent attention in Nigeria public financial system. Port Harcourt: T&D press limited, 281

Pwc (2021). *1.6 million people are paying most of South Africa's income tax.* South Africa: Business Tech. https://businesstech.co.za/news/finance/472698/1-6-million-people-are-paying-most-of-south-africas-income-tax/

SARS (2021). Tax Statistics-2021. National Treasury and South African Revenue Service Statistical Bulletin. https://www.sars.gov.za/wp-content/uploads/Docs/TaxStats/2021/Tax-Statistics-2021-Highlights.pdf

Vassilis, T. (2009). Growth and Convergence in Income Per Capita and Income Inequality in the Regions of the European Union. *Spatial Economic Analysis 4*(3). https://doi.org/10.1080/17421770903114711

WB (2021). Gross Domestic Product Growth Rate 2021. World Bank. https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG?locations=NG

William, G. & Andrew, A. S (2014). *Effects of Income Tax Changes on Economic Growth.* Brookings: Economic Studies. Available at: https://www.brookings.edu/wp-content/uploads/2016/06/09_effects_income_

World Bank (2022). Taxation and Economic Growth – World Bank. https://www.worldbank.org/en/topic/taxes-and-government-revenue